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# African Swine Fever Eradication in Haiti

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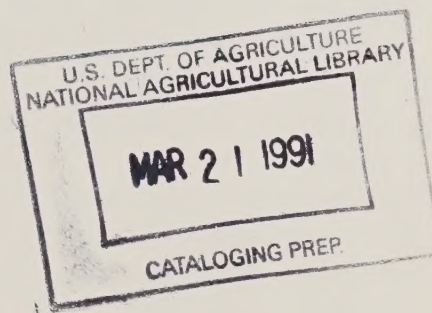
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Cover photo:  
Haitian women carrying pig to slaughter.

December 1988

# African Swine Fever Eradication in Haiti

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## Acknowledgments

There were few people who thought the African swine fever (ASF) eradication program in Haiti would be successful when it was proposed, and even fewer when it was started, and inevitable problems began to appear. However, the dedication and hard work of the Haitian and international workers in the program turned the campaign into a success.

Although the personnel came from many different countries, they were united in a common goal and provided a splendid example of what can be done when people work together.

The names of the participants in this landmark effort are not used to avoid overlooking someone. However, those who worked in the program know very well how important their contributions were, and it is to them that this report is dedicated.



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### History

ASF existed for many years in Africa as an inapparent infection in the wild indigenous pigs (warthogs, bush pigs, and giant forest hogs) and the soft tick *Ornithodoros moubata porcinus* (Walton). It was recognized as a disease agent when it was contracted by domestic pigs of European origin. The British scientist R. E. Montgomery established the viral nature of the disease in 1921, and studied the host range, mode of transmission, and the stability of the virus under a variety of environmental conditions, and indicated the possible role of the warthog as a reservoir of the virus in nature.

The disease occurred for the first time outside the continent of Africa in 1957 when it appeared in garbage-fed pigs near the airport in Lisbon. It was believed to have come from the Portuguese colony of Angola. This first incursion was eradicated in 1958 after 6,103 pigs died of the disease and 10,354 more were slaughtered as contacts. The disease was described as peracute, and the mortality in affected animals was virtually 100 percent. In 1960, the disease reappeared near Lisbon apparently as a new introduction from Africa and spread to Spain the same year. Since then, ASF has been enzootic in the Iberian Peninsula, and losses of 2 to 3 percent of the national swine populations have been reported annually in both Spain and Portugal.

ASF outbreaks occurred along the Spanish border in France in 1964, 1967, and 1974. On each occasion, the disease was eradicated by a drastic slaughter program. The disease also spread to Italy in 1967. During that year 100,000 pigs were slaughtered in 28 provinces. It was finally eradicated in 1969 after estimated losses of at least \$5 million had been sustained. ASF first appeared in the Western Hemisphere in Cuba in 1971. It was eradicated but only after more than 400,000 pigs died or were slaughtered. In 1977, there was a considerable increase in outbreaks of ASF in Portugal and Spain, and in 1978 the disease appeared in Malta and Sardinia, and in the Western Hemisphere in Brazil, the Dominican Republic, and Haiti. The disease was



ASF has existed for many years in Africa as an inapparent infection in warthogs, bush pigs, and giant forest hogs.

eliminated in Malta by the death or slaughter of the island's entire population of 80,000 pigs.

African swine fever apparently entered the Dominican Republic in February 1978. Relatively little information is available about the initial stages of the outbreak. Some early accounts place the first cases in the western region of the country near a dam construction site manned by Spanish nationals. However, it is now generally accepted that initial mortalities in pigs occurred in the town of Villa Mella near Santo Domingo. It is probable that the disease was introduced via infected pork scraps from an international flight. By the middle of the year, mortalities, presumably due to ASF, were reported in and around Higüey in the eastern region and San Juan de La Maguana in the west. The disease was originally thought to be hog cholera, which was then endemic in the Dominican Republic, and the animal health authorities responded by mounting a vaccination campaign using the China (K) strain of hog cholera virus. When the vaccination campaign failed to halt the death losses, ASF was suspected and specimens were sent to the Plum Island Animal Disease Center in the United States. A diagnosis of ASF was received on July 5, 1978.

### Description of the Disease

African swine fever (ASF) is one of the most destructive diseases of pigs. It is a contagious viral disease which occurs in clinical forms ranging from peracute to chronic. Typically, the disease runs a peracute or acute course, and is characterized by high fever, cyanosis of the skin, pronounced hemorrhages in lymph nodes and internal organs, splenomegaly, with a morbidity and mortality approaching 100 percent. This was the predominant form of the disease as it was originally encountered in Africa and as it first appeared in Portugal and Spain in 1957 and 1960.

Subsequently, the clinical manifestations of ASF have become more variable, and it is now recognized that the virus of ASF is capable of producing subacute and chronic disease as well as mild or inapparent infections.

Unfortunately, there is no effective vaccine or treatment for the disease, and usually the drastic measure of depopulation of affected and exposed swine must be applied to control or eradicate it.



### Clinical Picture and Lesions

When ASF first entered the Dominican Republic and then Haiti, it bore many similarities to the classical form of the disease originally described in Africa. Mortalities exceeding 90 percent were reported in some herds, although the mortality rate was apparently somewhat variable. Hyperemia of the skin was reported in white pigs, and engorged, friable spleens, hemorrhagic lymph nodes, and hemorrhages in the kidneys were observed. Ascites and

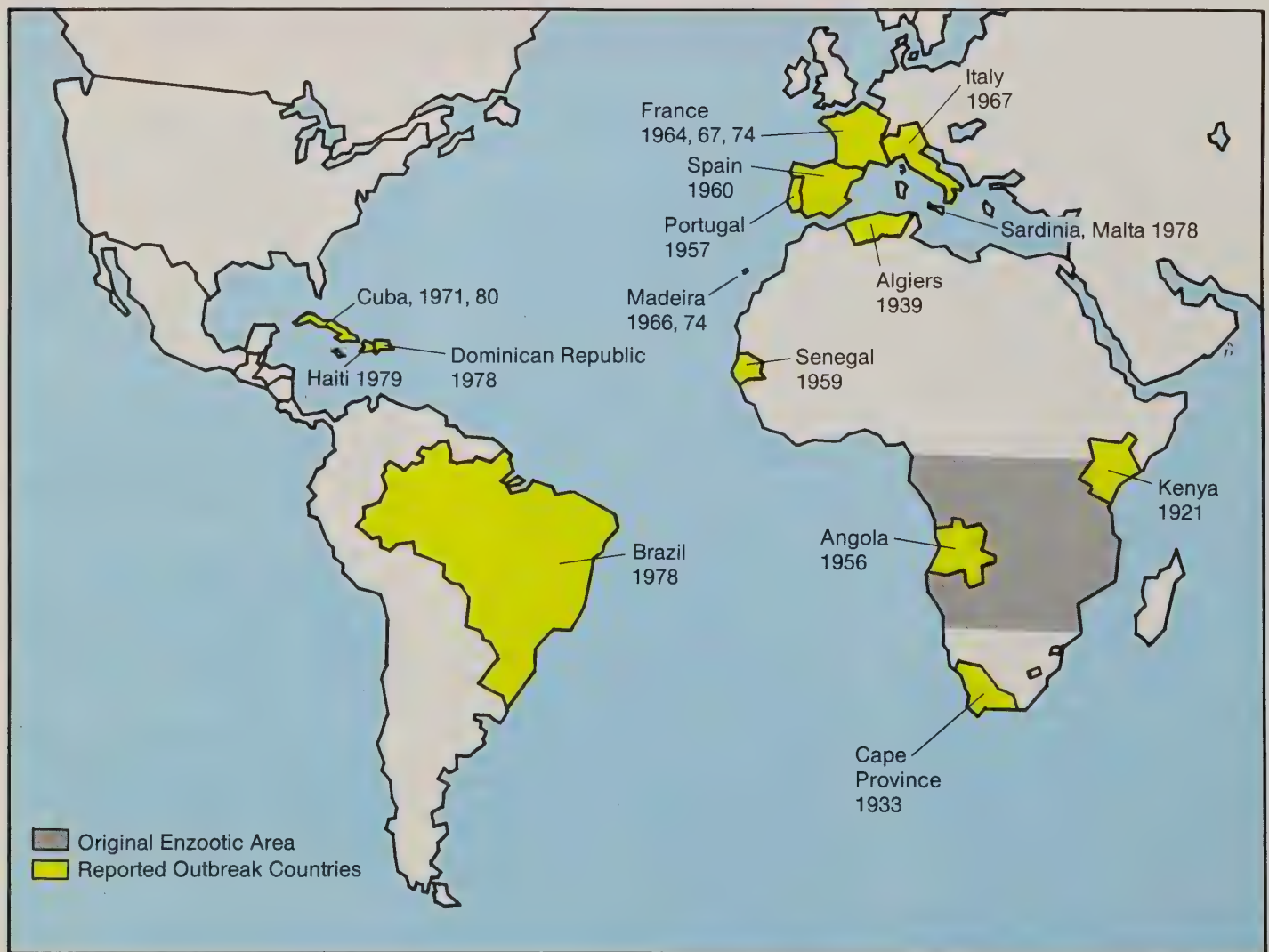
edema were commonly found on post-mortem examination, and pregnant sows aborted.

There is no question that the severity of the disease subsided with time and with successive passages of the virus through pigs, and much attention has been drawn to the relatively low pathogenicity of ASF virus isolates from the Western Hemisphere. In the U.S. Department of Agriculture (USDA) Plum Island Animal Disease Center laboratory, the Dominican isolate caused a mortality of only 20 percent and produced lesions far less

dramatic and consistent than those associated with classical ASF. It should be borne in mind that the virus used in the Plum Island experiments was isolated approximately 5 months after ASF entered the Dominican Republic and that the initial clinical and pathologic picture bore far greater resemblance to classical ASF. Nevertheless, the fact remains that ASF virus in the Dominican Republic evolved into one of low virulence. In some instances, serologic evidence of exposure to ASF virus was found in the absence of any history of clinical

Figure 1.

### ASF Outbreaks Have Occurred Worldwide



illness. This may have been due in part to inaccurate or incomplete histories, but the pigs were apparently healthy at the time of slaughter, and the impression gained was one of inapparent infections.

### Transmission

In nature, ASF is transmitted both horizontally and vertically among soft ticks of the genus *Ornithodoros* and may perhaps be regarded as a separate tick virus. Yet, it also infects mammals and has apparently had a long association with the wild pigs of

Africa, as a host-parasite relationship exists that allows prolonged infection to occur without signs of disease. There is no evidence of horizontal or vertical transmission of the virus among warthogs nor have attempts to demonstrate transmission from infected warthogs to domestic pigs been successful. It appears likely that transmission of the virus among warthogs is chiefly by the bites of ticks that inhabit their burrows, and transmission to domestic pigs is mainly by ticks carried on and disseminated by warthogs. However, it has also been demonstrated that the virus can be

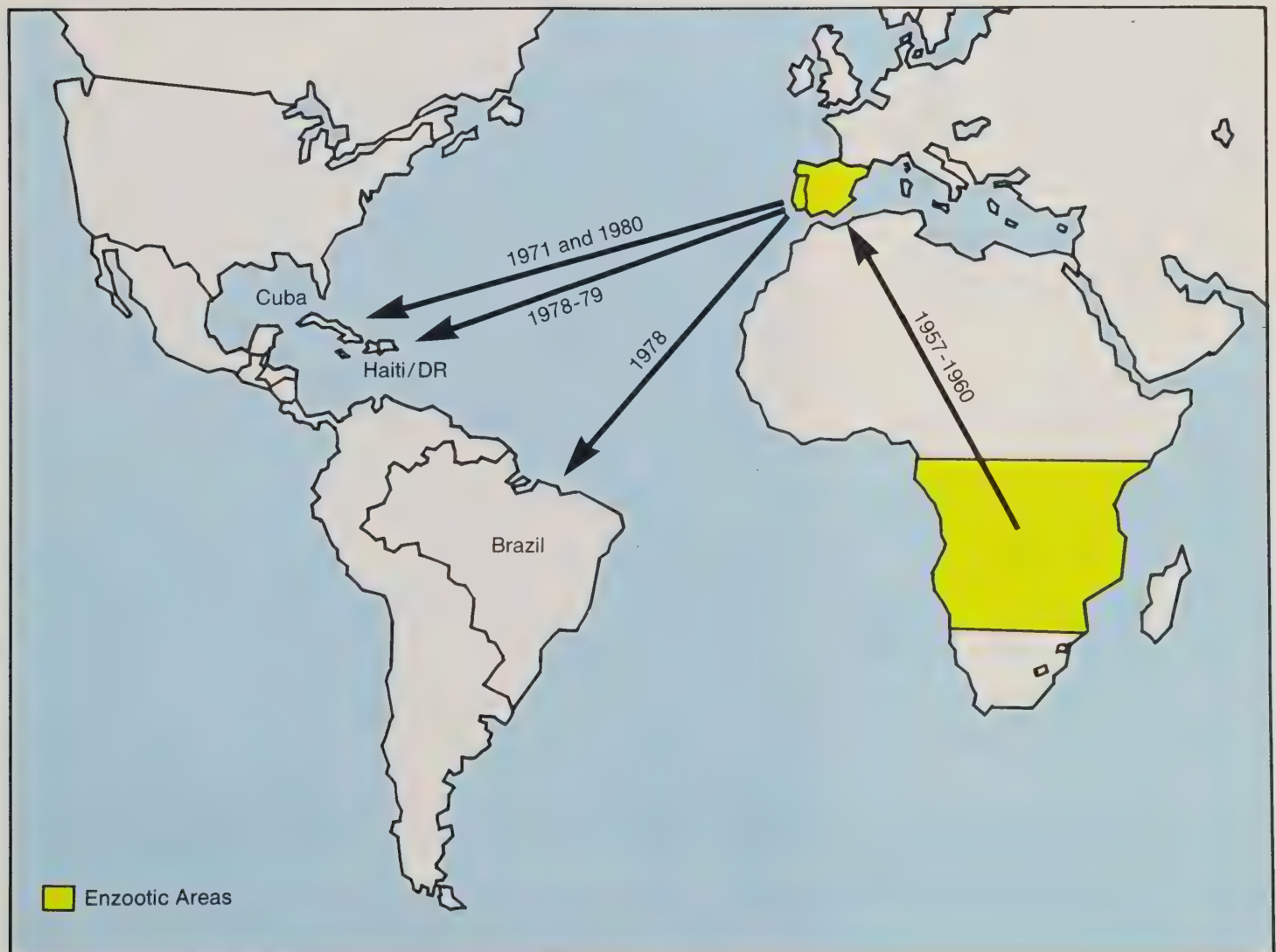
transmitted by the ingestion of infected pig tissues.

We know that ASF-infected ticks pass the virus to their offspring by various methods (stage to stage, male to female, and egg transmission) which are repeated by each new offspring. Thus, the tick can perpetuate the virus for at least 8 years after its last feeding on an ASF-infected pig. This is one of the primary problems in control and eradication of disease in countries where *Ornithodoros* ticks, capable of transmitting the disease, become infected

Figure 2.

### Map Shows How African Swine Fever Spread to Haiti.

Dates Indicate Outbreaks.





and thus can serve as a reservoir of the disease for many years. This is especially important where pigs are permitted to move about freely and where wild pigs exist.

#### Field Diagnosis

There are a number of swine diseases that may have clinical signs and gross lesions similar to those of ASF. Hog cholera is the outstanding example. The two diseases, especially in their modified forms, are virtually impossible to distinguish from one another in the field. Laboratory tests are required for differentiation. If necropsy reveals a severely engorged spleen and hemorrhagic lymph nodes, a provisional diagnosis of ASF is certainly in order, but laboratory confirmation is mandatory.

It cannot be too strongly emphasized that the ASF viruses involved in the outbreaks occurring in the Iberian Peninsula and the Western Hemisphere in recent years were apparently of lower virulence and produced a high incidence of subacute infections. The mortality rates were often quite low. These forms of ASF can be very difficult to recognize, especially in a country where the disease had entered for the first time, and the farmers and veterinarians have had no previous experience with it.

#### Laboratory Diagnosis

A positive diagnosis of ASF requires either detection of the virus or demonstration of the presence of ASF-specific antibody. Although a number of tests are available for these purposes, it must be kept in mind that there is no vaccine or treatment for ASF and that control and eradication of the disease depend upon detection and elimination of infected and



White-skinned hogs with ASF may show red, blotchy & discolorations on their ears, snouts, tails, legs, abdomens and flanks.



exposed swine. The effectiveness of this procedure depends to a large extent on the speed with which it is initiated and carried out. Rapid diagnosis is essential, and speed as well as sensitivity and accuracy must be considered in selecting the laboratory tests to be conducted.

Because no single test can be expected to detect the disease under all conditions, the samples submitted to the laboratory should be such that an array of tests may be conducted if necessary. Spleen, liver, lymph nodes,

whole blood, and serum should be submitted when an initial diagnosis is being sought. After the presence of ASF has been confirmed, and the laboratory is functioning in support of an eradication program, a serum survey may be conducted to determine the limits of the outbreak.

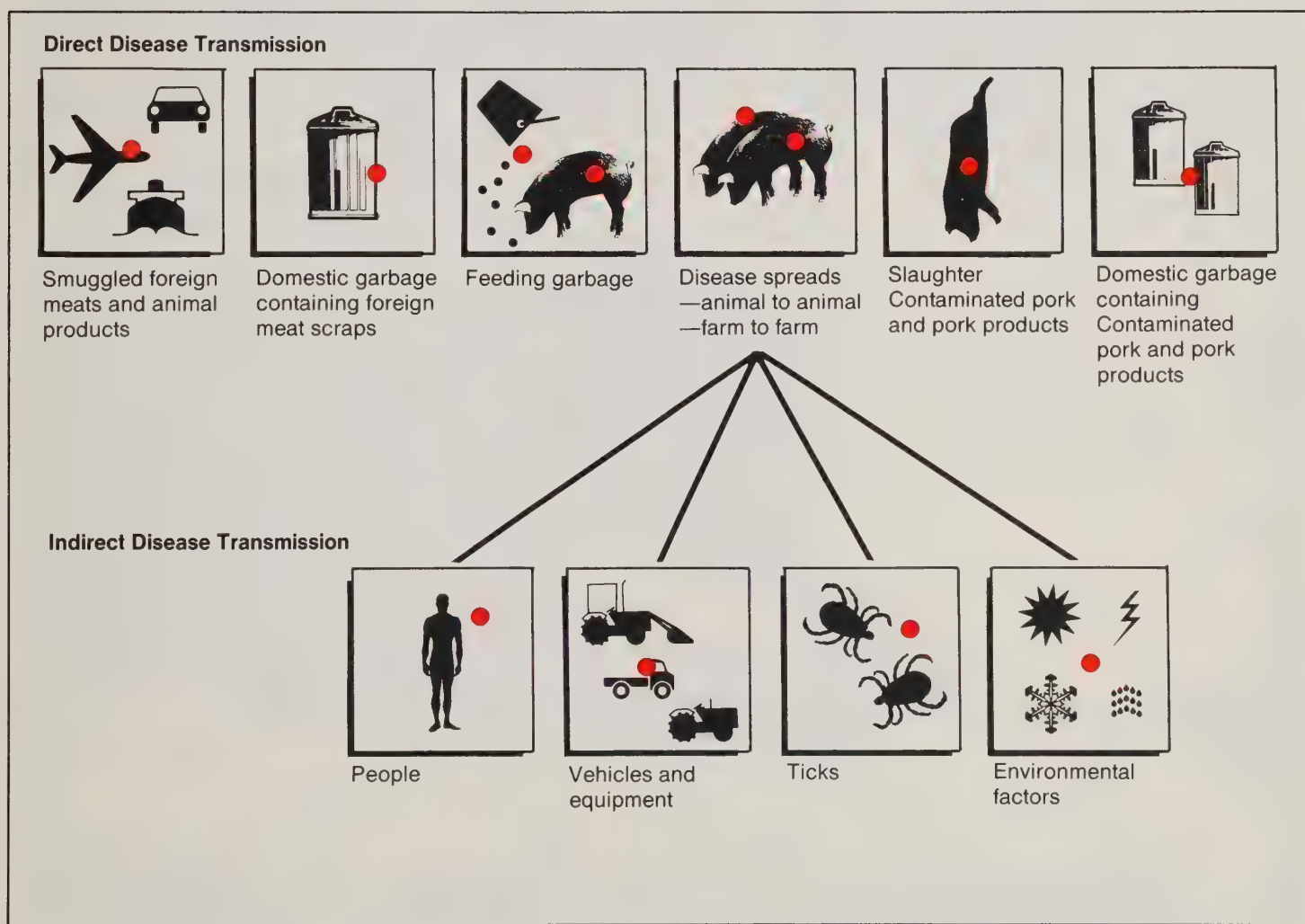
### Prognosis

In the peracute and acute forms of ASF, mortality is virtually 100 percent, but the disease as it is now usually encountered outside the continent of Africa may have a much lower

mortality and a high incidence of subacute and chronic infections. Although the surviving pigs may appear to have escaped the infection, they may have ASF antibodies and may, in fact, be virus carriers. Until laboratory tests have been done to determine the status of the apparently healthy survivors of an outbreak caused by an ASF virus of low virulence, they should be regarded as exposed animals and be treated accordingly.

Figure 3.

## African Swine Fever Spreads Via Both Direct and Indirect Transmission.



A number of factors have complicated and forestalled efforts to control and eradicate ASF. There is no effective vaccine; the virus persists in its natural reservoirs; clinical forms of the disease have evolved that are difficult to recognize; and the virus may be widely disseminated before a positive diagnosis is made. Furthermore, inapparent carriers among domestic pigs now apparently play a major role in maintaining the disease in the enzootic areas.

Because there is no treatment or prophylaxis for ASF, eradication can only be achieved by quarantine, slaughter, and sanitary disposal of all sick and exposed pigs by deep burial or incineration. Adequate indemnity should be offered as an incentive to encourage farmers to present their sick and exposed pigs for slaughter. On islands or in well-circumscribed areas where all of the pigs are to be eliminated, healthy pigs may be processed for local consumption, but the offal must be disposed of by burial or incineration. The premises must be cleaned and treated with a suitable disinfectant and insecticide and remain free of livestock for at least 30 days. Disinfectants containing o-phenylphenol combined with surface active agents are effective in destroying the virus. Before restocking the premises, a few sentinel pigs should be held in the area for a reasonable length of time to monitor the effectiveness of the cleanup.

### **International Activities Related to ASF in the Western Hemisphere**

A few weeks after ASF was confirmed in Brazil and the Dominican Republic, the Food and Agriculture Organization of the United Nations (FAO) called a meeting in July 1978 in Lima, Peru, to review the characteristics of ASF and to define the emergency measures required to cope with the disease. At the subsequent FAO Regional Conference for Latin America held in Montevideo, Uruguay, in August 1978, a resolution calling on FAO to coordinate ASF control programs in Latin America and the Caribbean was adopted. FAO committed over \$1.3 million from its Technical Cooperation Programs (TCP) to provide equipment, consultants, or fellowship training for Brazil, Uruguay, Argentina, Paraguay, Bolivia, Peru, Colombia, Venezuela, Ecuador, the Dominican Republic, Haiti, Chile, Panama, Guatemala, Malta, and Sao Tome. In fact, requests for assistance exceeded the TCP funds earmarked for emergency situations.

FAO convened two meetings in December 1978, one in Mexico City to discuss the problem of agricultural commodity contamination by ASF and another in Rome to discuss research needs for ASF. In October 1979, an FAO meeting was held in Panama to review ASF situations in the region and to discuss and identify action programs and requirements in each country.

Through FAO's bimonthly publication "ASF Newsletter," issued by the Regional Office in Santiago, Chile, countries of the region were kept informed of the worldwide ASF situation as well as the various actions taken by affected countries and those at risk.

A series of training courses was held under the auspices of FAO through its TCP for both field veterinarians and laboratory specialists. A total of 78 field veterinarians were trained in the Dominican Republic, and 24 laboratory specialists were trained at USDA's Plum Island Animal Disease Center, New York, and the National Institute for Agriculture Research, Madrid. An additional training course for laboratory staff was held in Brazil in November/December 1979. Funds from sources other than FAO were provided by the Inter-American Development Bank (IDB), the United Nations Development Program (UNDP), and the U.S. Department of Agriculture (USDA).

## Overview of Haiti

Haiti occupies the western third of the island of Hispaniola. About two-thirds of the 10,700 square miles is mountainous terrain, unfit for cultivation. Haiti is the poorest and most densely populated nation in the Western Hemisphere. Its population is estimated at 5.5 million.

The entire population speaks Creole. Between 80 and 90 percent are illiterate. French, the country's official language, is spoken by only about

10 percent of the population. Voodoo exists side by side with Catholicism, the official religion. The Section Chief and the houngan (voodoo leader) are the principal authorities in the villages.

Per capita annual income is about \$300. Overcrowding, lack of sanitation, malnutrition, and a shortage of land to cultivate contribute to making life difficult for the Haitian rural population. Life expectancy is about 54 years. Haiti has one of the highest infant mortality rates in the world.

### Swine Production Before the ASF Outbreak

The origin of the Haitian pig is still in question. It may have descended from a cross between the Spanish hog and the wild indigenous pigs, although it is claimed that there were no pigs on the island when Columbus arrived. Whatever its origins, centuries of adaptation produced a very coarse-looking animal, able to survive under the most difficult conditions.

Figure 4.

### Haiti Shares the Island of Hispaniola with the Dominican Republic.





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The native pig was light in weight, only about 2 pounds at birth, with little gain during the first year. Even at 2-1/2 to 3 years of age, the pig would rarely reach 100 kg. The average litter size did not exceed three to four piglets. A combination of poor nutrition, disease, parasitism, and inbreeding contributed to low sow productivity.

There were very few modern piggeries in Haiti. The pigs were left to forage for themselves or were tied up under a tree. Their rations consisted of whatever was available, including human and domestic wastes, crop residues, wild plants, roots, insects, and worms. Mortality was high, especially in the young pigs.

In spite of all these difficulties, the Haitian pig was one of the main elements in the subsistence economy of the rural population. Raising a few pigs was one of the few ways peasants could accumulate any capital or have access to any cash; literally a "piggy bank." An investment of \$5-10 for a piglet would give a return of about \$110 in 15 months, with practically no expense for care or feed. It was traditional for the peasant who needed cash for schooling or burials or some emergency to fatten a pig and sell it. The pigs did not really constitute a source of protein for the rural population, since they were mostly sold and the cash used for other necessities.

The pig played an important role in the ecology of the Haitian rural

agricultural society by helping to prepare the soil for tilling, destroying pests and diseases harmful to plant growth, providing a major source of fertilizer, and controlling organic wastes. In addition, pigs were highly valued as religious offerings. At certain times of the year, the sacrifice of a black native pig was required as an integral part of the voodoo culture.

According to estimates made in 1978, the swine population ranged from 1.2 to 1.6 million pigs. About 80 percent of the rural population had pigs, anywhere from one to four pigs per family. Some 600,000 pigs were slaughtered annually in abbatoirs, but a larger number were slaughtered outside of these facilities.

### Prevention Efforts

When ASF was confirmed in the Dominican Republic in July 1978, officials there and in Haiti decided to kill all the swine within 15 kilometers on both sides of the Haitian-Dominican border. The purpose was to develop a barrier that would prevent spread of the disease from the Dominican Republic to Haiti. Officials in Haiti listed 20,671 hogs as slaughtered. This program was carried out concurrently by the Ministry of Agriculture personnel and the Haitian Army. However, the two slaughter efforts were not coordinated, and the owners of swine slaughtered were not compensated. While the Ministry claimed to have a list of owners whose swine were killed under their supervision, no such list existed for those swine killed by the military. Individual efforts of local groups to maintain records were not completely successful because the Haitian villagers tended to be hesitant about including their names on any official list. In addition, transporting pigs or pork products across the border was forbidden.

### Outbreak in Haiti

In December 1978, swine deaths probably due to ASF were reported in Haiti's Artibonite Valley. The disease apparently gained entry from the Dominican Republic, in spite of the depopulation of pigs along the border. According to official estimates, more than 30,000 swine died in the initial outbreak. The Ministry of Agriculture (MARNDR) took steps to decrease incountry movement of pigs and their byproducts, while an embargo was imposed on the export of pig meat and byproducts to protect other countries.

### Provisional ASF Laboratory—Serum Surveys

Shortly after ASF was diagnosed in Haiti, FAO and USDA assisted Haiti in setting up a provisional ASF laboratory. FAO also initiated a serum survey throughout the country to determine the extent and distribution of the disease. By November 1979, 1,368 samples had been collected, and 93 (7 percent) were found to be positive. Mainly because of a lack of funds or an animal health infrastructure, the Government of Haiti (GOH) took no action.

The Government of Haiti requested assistance from FAO and the United States. Samples collected from pigs that had died were sent to the Plum Island Animal Disease Center. On January 26, 1979, it was confirmed that the samples were positive for ASF.

### Spread of the Disease

By the end of 1979, the swine population was estimated to have dropped to about 600,000 from the original 1.2 to 1.6 million. Also, the disease had evidently spread to all parts of the country. Farmers everywhere were complaining about the loss of some or all of their pigs. ASF was plainly enzootic in Haiti. Many pigs had evidently survived the initial outbreaks and showed no outward evidence of the disease, but a good number had undoubtedly remained as chronic carriers of the ASF virus.

### Proposals for Eradication

FAO then recommended that the disease be eradicated from Haiti by the elimination of the entire swine population. Representatives from the Inter-American Institute for Cooperation on Agriculture (IICA), USDA, and several other organizations and countries were invited to Haiti to consider the feasibility of an eradication program and to make recommendations on how to deal with the situation. The consensus was that ASF was so widespread that it was too late to control it by routine serological surveys with elimination of the positives (the traditional test and slaughter method). The only reasonable alternative was to slaughter the whole pig population.

Cuba suffered another ASF outbreak in 1980, which again had to be eliminated by drastic depopulation methods. Although there is no certainty about the source of the outbreak, it was suspected that it had entered in some way from Haiti. This increased the pressure on Haiti to take some action to control or eradicate the disease within its own territory. In addition, and more urgently, the Dominican Republic, on the same small island, was embarking on an ASF eradication program, and there could be no hope of lasting success if the disease remained across the border in Haiti.

The Government was faced with an extremely difficult decision. It could try to live with ASF, which would add an extra burden on the already precarious situation in rural Haiti. Swine breeding was already suffering from high mortality in young pigs. ASF would worsen the situation even more. However, the elimination of all the swine was equally difficult to accept. It was not known if the marginal peasant families could survive the sudden total extermination of their swine herds. This would eliminate their one source of savings and cash accumulation, at least until a swine repopulation effort could be undertaken. In addition, the pigs were important to the peasants for religious and cultural reasons.

Another difficulty existed. Although there seemed to be support available to cover the cost of getting rid of the pigs, no one had come forward to guarantee funds for the

replacement pigs or was able to predict how soon the peasants would have pigs to replace the ones they had lost, even if funds were available to buy them. In addition, all swine repopulation plans recommended starting with pigs free of ASF and a wide variety of other diseases. However, the Government of Haiti could not be sure that the high-quality replacement pigs would be able to adjust and survive under Haitian conditions.

Also, the disease may have reached its peak in 1980. By the time the eradication program began in May 1982, no more pigs were dying. The average villagers believed the epidemic to be over and saw no reason for their pigs to be killed.

The Government of Haiti continued to deliberate and after 2 years of considering the alternatives, cautiously opted for an eradication program. In September 1980, at an annual IICA Board of Directors meeting in Mexico City, the Haitian Minister of Agriculture requested IICA's support in obtaining funds for the program. A resolution was passed by the Board directing IICA to take on this commitment.

Representatives from Canada, the United States, and Mexico, recognizing the threat that ASF constituted for their own countries and the rest of the Western Hemisphere, expressed interest and a willingness to cooperate.

### Limited Animal Health Program

One of the difficulties involved in planning for the eradication program was that the animal health program in Haiti at the time of the outbreak was quite limited. With the shortage of funds for vehicles, gasoline, per diem, and supplies within MARNDR, animal health activities were limited essentially to vaccination programs for such diseases as rabies and anthrax. There were only four Haitian veterinarians in the country and, in addition to their private practices and MARNDR responsibilities, each one directed some aspect of the program, which was carried out in the field by some 60-70 veterinary assistants.

### IICA's Efforts to Organize an Eradication Program

IICA had amended its charter in 1979 to include health programs for both animals and plants. It had already resolved that ASF eradication in Haiti had a very high priority.

On the basis of the Board's resolution, IICA began immediately to organize support for an ASF eradication program in Haiti. Potential donors were contacted, and by the following month, a program proposal had been developed in collaboration with representatives of the United States, Mexico, Canada, and Haiti. Support came from the U.S. Animal Health Association (USAHA), the U.S. National Pork Producers Council (NPPC), and the (U.S.) National Association of State Departments of Agriculture (NASDA).

On January 16, 1981, with the bipartisan support of personnel in both the outgoing and incoming administrations, the Acting U.S. Secretary of Agriculture declared that the presence of ASF in Haiti constituted an emergency for the United States, which made U.S. funds available as soon as an acceptable eradication program could be formulated. IICA called a meeting the next day in Washington, with all agencies concerned represented: USDA, IDB, UNDP, FAO, Agriculture Canada, the Mexico Department of Agriculture and Water Resources (SARH), the World Bank, the United States Agency for International Development (USAID), and the Canadian International Development Agency (CIDA).

As a result of this meeting, a Coordinating Committee was appointed with representatives from Canada, the United States, Mexico, and IICA to develop an eradication plan. The Committee met the next month and proposed the following guidelines:

- IICA would oversee the program, with a Haitian as director and an American as codirector.
- The United States, Canada, and Mexico would contribute both funds and personnel. The Dominican Republic was also invited to participate and subsequently provided some veterinary personnel.



- The UNDP could possibly assist with funds for a laboratory.
- A target date of April 1981 was set to initiate the program.

Representatives of the Committee met with Haitian Government officials that same month to discuss the proposal. The Haitian Government was urged to request assistance from the IDB for a repopulation phase which would follow the eradication program.

The Haitian Government was understandably reluctant to embark on an eradication program that required the elimination of all its swine without being assured that there would be funds to replace them. The IDB expressed interest in providing assistance, but this would depend upon a successful conclusion to the depopulation program. A stalemate was developing, but finally the IDB agreed to provide a Letter of Intent specifying that they would be favorable toward granting a loan if the Government of Haiti (GOH) made a formal request after eradication was completed. This was finally acceptable to GOH. The United States signed an agreement with IICA to proceed with the program in April 1981, but the agreement between IICA and the Government of Haiti was not signed until July 1981.

IICA signed similar agreements with Canada and Mexico in August 1981.

### **Development of a Workplan**

In the meantime, in March 1981, IICA had hired the proposed international codirector for the project, and he and the proposed Haitian director proceeded to develop a workplan for the project.

Many problems had to be considered:

- How to recruit qualified international personnel for long-term assignment on very short notice, and how to insure some French and/or Creole language capability.
- How to obtain all the necessary equipment and supplies without delay. Most of the supplies had to be imported.
- How to obtain funds for the improved replacement swine and for feed to maintain them until they could adjust to Haitian conditions.
- How to prevent wild pigs from remaining as an ASF reservoir after elimination of the domestic pigs.
- How to prevent *Ornithodoros* ticks from remaining as a source of infection for the replacement pigs.
- How to develop a suitable animal health organization to prevent future outbreaks.
- How to prevent reintroduction of the ASF virus.

Many problems were anticipated in providing adequate administrative services for an organization run by an international agency which had never conducted a program of this size. This situation was complicated by the fact that funds and personnel were provided by three different donor countries and one other international agency, each with its own administrative procedures and requirements.

### **International Participation**

The United States agreed to contribute \$14,500 million and Mexico, the equivalent of \$2,300 million. Canada offered to contribute up to \$400,000 in salaries and support costs for its personnel. The United States and Mexico also were to assign personnel to the project, and FAO was to provide a laboratory consultant and some funds for laboratory supplies and equipment.

### **Coordinating Committee**

For the donor countries to maintain close ties with the project, a Coordinating Committee was established where high-level representatives of the donors and the Haitian Government would meet every 3 months with project officials to review progress and approve any changes in the workplan. Representatives of U.S. and Canadian pork producer organizations also would attend these meetings.

From the initiation of the program to its completion, the Coordinating Committee met 12 times.

## The Project for ASF Eradication and Swine Industry Development in Haiti

### Organization of the Project

It was agreed that the project, which came to be known as PEPPADEP (Project d' Eradication de la Peste Porcine Africaine et du Developpement de l' Elevage Porcine en Haiti - Project for ASF Eradication and Swine Industry Development in Haiti), would be run by a Haitian director and his U.S. counterpart, the international codirector. Similarly, there would be Haitian and international counterparts in charge of all major activities (Field Operations, Technical Services, Laboratory, Information/Communications, Administration, Personnel, Finance, Procurement, and Regional Veterinary Supervisors). Both counterparts in each activity would be equally responsible.

All four Haitian veterinarians in the country were assigned to work in the program. One served as Director, another as Chief of Operations, another as Chief of Technical Services, and the fourth as Director of the ASF Laboratory.

The project was to be divided into four phases:

- Phase 1:* A 6-month planning and public education phase.
- Phase 2:* A slaughter-compensation phase.
- Phase 3:* Cleaning and disinfection and a clean-up (raking) phase (looking for the last missed or hidden pigs)
- Phase 4:* Sentinelization to make sure that there was no residual virus.

The Haiti-IICA agreement was signed on July 21, 1981, and immediate action was taken to get the project under way. The Haitian director and the International codirector were officially designated. The workplan was activated, and key Haitian staff members were hired. Canadian and IICA personnel arrived shortly afterward, and the U.S. and Mexican personnel sometime later.

Essential equipment and supplies were purchased locally or ordered from abroad. The vehicles required had to be selected to meet the difficult

conditions in the field. A radio communications system was developed to insure contact with field personnel.

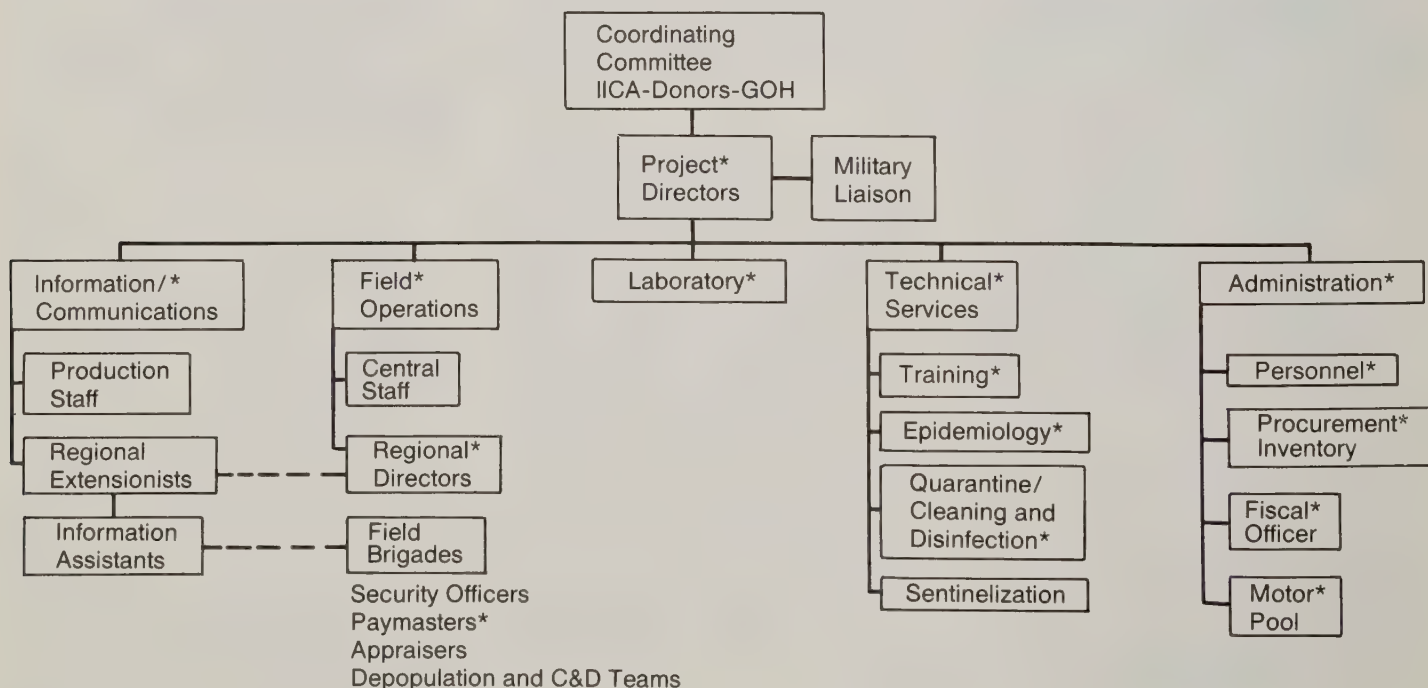
IICA assigned an administrative officer to the project; a separate office building was rented in Port-au-Prince for the central headquarters; a motor pool was established; and offices were also rented in 11 field locations. Operational and administrative procedures manuals were developed.

### Preparations for Field Operations

A Compensation Committee was formed to study the desirability of various forms of compensation including substitute animals, education vouchers, and cash. Based on their findings, it was decided that owners of swine would be compensated directly at the time of slaughter, in cash. A small group was assigned the task of determining a fair rate of compensation. Based on their surveys, they recommended paying \$40 for an adult pig, \$20 for a medium-sized or young feeder pig, and \$5 for each piglet, with the owners being given the carcasses for their own use.

Figure 5.

### PEPPADEP - Organization Chart



\*IICA or International Counterparts

There was some concern about the risk of massive contamination by the ASF virus of slaughter sites and the surrounding countryside as the owners dragged the carcasses away or dressed them out on the spot. However, it was decided that this would be an acceptable risk, in view of the hot, dry climate during most of the year and the considerable period of time that was expected to pass in most localities before the replacement pigs were available.

There was interest in providing the owners with substitute animals

once their swine were eliminated. This proved to be not practical or acceptable for a variety of reasons, and only one distribution of some 4,000 4- to 6-week-old chickens was made.

#### Public Information Program

An information program was crucial to gain the cooperation of the rural population, for there would be unlimited opportunity to hide pigs if the owners so wished. Many individuals and groups were opposed to the program. There was still resentment that no compensation had been

paid for the pigs killed along the Haiti-Dominican Republic border in 1979.

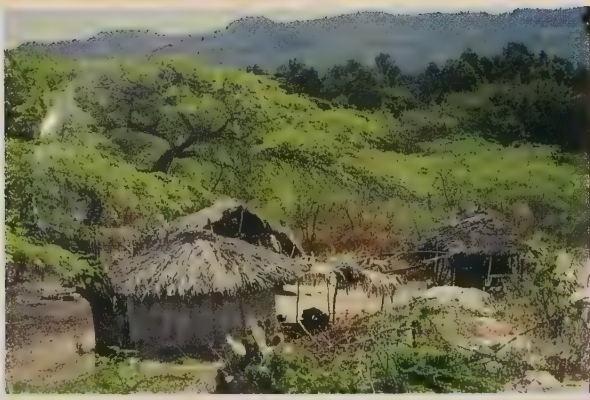
The program was initiated in the fall of 1981. Seven extensionists were assigned, one to each of the seven agricultural regions, with audiovisual equipment and publicity material. They were later augmented by information specialists or "animateurs." Because of the high illiteracy rate in rural areas, audiovisual material was used at meetings with swine owners and local officials. Posters, slide shows, and flipcharts were developed. All meetings and everything used in the

Figure 6.

### African Swine Fever Surveillance in the Republic of Haiti, July 29, 1981, to September 30, 1981.







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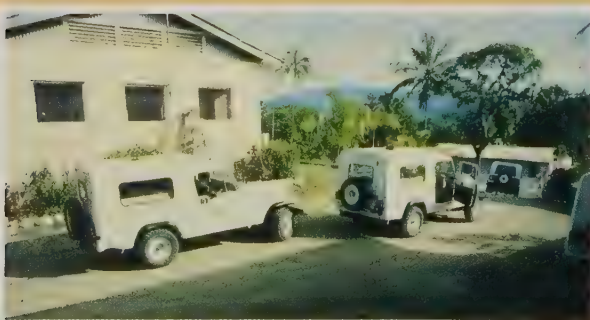
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Photo 1  
Typical housing and terrain in rural Haiti.



Photo 2  
Traditional backyard pigs in Haiti.



Photo 3  
Local slaughterhouse in Haiti.



Photo 4  
Preparation and use of local pork in Haiti.



Photo 5  
Rural road conditions in Haiti.



Photo 6  
A meeting of the Coordinating Committee.



Photo 7  
A staff meeting with international advisors.



Photo 8  
A field meeting.



Photo 9  
Central Field Headquarters—PEPPADEP.



Photo 10  
A field base.



Photo 11 & 12  
PEPPADEP signs in public areas.



Photo 13  
Distributing information materials to villagers.



Photo 14  
Training for field staff.



Photo 15  
Laboratory personnel testing for ASF.



Photo 16  
Collecting tissue samples from slaughtered pigs to detect incidence of ASF.





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Photo 17  
Paymasters compensating villagers for slaughtered pigs to detect incidence of ASF.



27

Photo 18  
Registering pigs at a slaughter compensation site.

Photo 19  
Collecting blood samples at a slaughter site.

Photo 20  
Swine slaughter at a site.

Photo 21  
Slaughtered pigs at a slaughter site.

Photo 22  
Burning debris in a pit to prevent spread of ASF.

Photo 23  
Preparing slaughtered pigs for local consumption.

Photo 24  
Singeing hair off slaughtered pigs used for local consumption.

Photo 25  
Road control post inspection point between ASF-free and ASF-infected areas.

Photo 26  
Cleaning and disinfecting a vehicle at a road control post before it leaves an ASF-infected area.

Photo 27  
Cleaning and disinfecting a courtyard after removal of pigs for slaughter.

Photo 28  
Since native swine would no longer be available to control organic wastes, latrines were distributed in the countryside.

Photo 29  
Villager transporting a latrine.

Photo 30  
After a 30-day quarantine period, sentinel pigs were placed at test sites.

Photo 31  
Villagers caring for sentinel pigs were paid a nominal fee and were given some of the offspring.



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field had to be in Creole. It was essential to establish a dialogue with everyone concerned, so that doubts and misconceptions could be addressed. Many questions were raised:

- Would owners be paid for their hogs? How much? What guarantees were there that the slaughter program would be different from the 1979 border campaign?
- Would the pigs owned by officials and big businessmen be slaughtered also?
- Why not just live with the disease and let nature take care of the problem?
- How would villagers pay for schooling once their pigs were gone?
- How would it be possible to eradicate ASF if people hid their pigs?
- Would someone be working on repopulation?
- Would the same people currently working be there for repopulation?
- What would the requirements be for obtaining new swine?
- Would everyone who had pigs be allowed to have new pigs?
- Would the new pigs survive in Haiti?
- Would there be a system to get credit and feed?
- Would future breeders be trained in caring for the new pigs?
- Would the project build latrines when the pigs were gone?
- What substitute animals would be available?

Figure 7.

**Map of the *Ornithodoros* Tick Survey in the Republic of Haiti, April 19, 1982, to February 1983.**



These were difficult questions, but they were dealt with fairly and honestly, and gradually confidence in the program began to develop. Special efforts had to be directed at urban groups (businessmen, particularly hotel, restaurant and tourism operators, travelers, and the urban public).

Much time had to be spent also in discrediting false rumors. These were often started by unscrupulous speculators who hoped to provoke panic selling of pigs, so they could buy them cheaply.

### **ASF Outbreak at a Commercial Piggery**

There was one large commercial piggery in Haiti at the start of the program. This piggery was located on the outskirts of Port-au-Prince. There was much speculation as to whether the owners would permit slaughter of all their pigs: their resistance posed grave public relations problems for the project.

However, the piggery experienced an ASF outbreak, and they voluntarily decided to sacrifice the whole herd.

### **Training**

An ambitious training program was planned which included courses on the following eight topics:

1. Use of audiovisual (AV) equipment and information techniques by information personnel.
2. Vehicle repairs and control for motor pool personnel.
3. Bleeding of swine for veterinary auxiliaries.
4. The care of sentinel pigs.
5. Laboratory techniques.
6. Quarantine procedures at airports, seaports, and border stations.
7. Operational procedures for the slaughter/compensation programs.
8. Cleaning and disinfection procedures.

### **Serological Surveys**

In an effort to determine the level of ASF infection just before the start of the slaughter program, the USDA in collaboration with a team of technicians from the University of Georgia organized some serological surveys of pigs in different areas of Haiti. In all, 1,295 swine were sampled from 83 different areas in the country. Seventy-seven percent of the areas had pigs that were positive for ASF. These areas (see map) were distributed throughout the country. The overall prevalence of seropositive swine by the IEOP (Immunoelectrophoresis) and/or ELISA (Enzyme Linked Immunosorbent Assay) tests was 20 percent.

### **Tick Surveys**

A survey of possible tick vectors was carried out by the same group. They discovered that *Ornithodoros puerторicensis* was present in Haiti. They collected 315 ticks from approximately 90 different sites where pigs were kept, but no ASF virus was isolated. Subsequent studies have shown that this tick is capable of transmitting ASF under experimental conditions.

### **Laboratory Services**

When ASF was diagnosed in early 1979, FAO and USDA assisted Haiti in setting up a provisional ASF laboratory at the Ministry of Agriculture office at Damien, just outside of Port-au-Prince. When preparations were being made for the actual eradication program, USDA assigned to Haiti an experienced ASF laboratory specialist, who continued directing activities at the project laboratory until the termination of the program.

Both ELISA and IEOP tests were used at the ASF laboratory. If there was some disagreement between the results of the two tests, the indirect immunofluorescence test was used.



## The Swine Slaughter/Compensation Program

Two conditions had been established in the IICA-Haiti Agreement for starting the slaughter program. One was to pay owners along the border for swine that had been killed in 1978. The other was to have the Government of Haiti declare a national emergency. On March 26, 1982, the Ministry of Agriculture began paying for the swine killed in 1978, and on April 28, 1982, the Haitian President issued the necessary proclamation for the eradication of ASF in Haiti. Consequently, the start of the program was

scheduled to begin in the Mole St. Nicholas area in the Northwest on May 11, 1982. (See Figure 8.)

### The Test Area Campaign

In response to pressure to start the slaughter program, the Minister of Agriculture sent an evaluation group to the Northwest to be assured that the people there were properly informed and ready to have the program begin. This area had been chosen to start the program because it was one of the most isolated and poorest areas in Haiti. If the program succeeded there,

it would have little difficulty elsewhere. This was to serve as a test of the workplan, and any problems encountered could be resolved before the campaign moved on to other areas.

The slaughter operations were very successful in the test area. The animators had prepared the population well, and the project received excellent cooperation. The villagers brought their pigs into the slaughter sites on foot, in wheelbarrows, on mules, or on their backs. Evidently, the owners were satisfied with the prices being

Figure 8.

### Map of the Seven Agricultural Regions in Haiti.



paid for compensation and the fact that they were also given the carcass. The knowledge that they would risk having their pigs confiscated later without any compensation if they did not bring in their pigs at the time scheduled must have helped convince them to cooperate. The news that cash was being paid on the spot for the pigs was another incentive. Finally, the villagers were promised that if they were the first ones to cooperate with the program, they would be the first ones to receive the

new pigs. Undoubtedly, the fact that the slaughter sites were established so that the maximum distance anyone had to travel was 10 km made things easier for the villagers and helped to ensure their cooperation.

#### Slaughter Site Operations

At the kill site, once the owners' swine were registered with the project, they were tagged in both ears and appraised. Serum samples were then taken from 10 percent of the pigs to determine the prevalence of the

disease. The hogs were killed and bled out. One ear with a tag was given to the owner while the other ear with a tag was sent to the paymaster. The registration document plus one ear with a tag for each animal was carried by the owner to the two paymasters, one a Haitian and one an international. Once the paymasters approved the document and checked the ear tags, the international paymaster counted the money and gave it to the Haitian paymaster, who counted it again as he paid the owner.

Figure 9.

#### Map of the Swine Slaughter/Compensation Sweep Strategy in 1982.





The international paymasters either spoke French or had been working in Haiti and spoke Creole.

### The Slaughter Program Proceeds

In the test area 21,305 swine were slaughtered and \$518,000 was paid in compensation, for an average of \$24.31 per pig. No wild pigs were found, and the number of swine killed turned out to be less than expected.

With the success in the Northwest, the Project Directors were confident that the eradication campaign might go faster than originally planned and began mapping out a country-wide strategy.

The campaign would proceed in two sweeps, one starting from the Northwest and proceeding east to the Dominican Republic border and then south to Port-au-Prince. The other would start at the western end of the southern peninsula, also proceeding east to the lower DR border and then north, meeting the other sweep at Port-au-Prince. This was to minimize chances of reinfestation by working toward the main commercial center of pigs and pork in Port-au-Prince. However, this would extend the resources of the program to the maximum. Many difficulties were experienced while conducting two widely separated operations simultaneously but, with hard work on everyone's part, they were successful.

As the slaughter program progressed and the fronts moved from site to site, pig dealers began to take advantage of the system and began trucking pigs from outlying areas. They evidently were offering lower prices to the owners for the convenience of not having to take them to the kill sites themselves.

Table 1:

### Swine Slaughter/Compensation (May 1982 - June 1983)

	No. Pigs Slaughtered	Compensation Paid in Dollars
Adults	168,007	\$6,720,280
Young	116,444	\$2,328,880
Piglets	99,940	\$499,700
Total	384,391	\$9,548,860

### Shortage of Funds

As the two sweeps began to approach Port-au-Prince, more pigs were being slaughtered than had been expected, and shortages of funds were developing. It became necessary to greatly reduce expenditures and to appeal to the donors for additional funds. Canada was not able to increase its contribution, and because of a recent peso devaluation, Mexico was not able to give the amount originally pledged.

Due to the lack of accurate censuses in Haiti, it was very difficult at the outset of the program to estimate the actual number of pigs that would have to be eliminated, so that the potential donors could have some idea of how much money would need to be budgeted for compensation and operations. As it turned out, a considerably larger number of pigs were found than expected, resulting in a shortage of funds in the later stages of the program.

### Termination of Slaughter Operations

Swine slaughter operations were slated to end by March 1983. However, because of the difficulties in receiving the necessary funds, the termination date had to be extended. Finally, in June 1983, after 384,391 pigs had been killed, the last kill sites near Port-au-Prince were closed.

### Distribution of Latrines

Since the native swine would no longer be available to clear much of the human feces in the countryside, the project agreed to pay for the distribution of latrines, as a public health measure, and provide training material for placement and installation. Actual placement was carried out by the Public Health Department and some 2,300 latrines were installed during the course of the project.

## Cleaning and Disinfection Activities

At the completion of the slaughter operations at each site, the bleeding pits were covered with 3 feet of earth and the whole area soaked with a disinfectant containing o-phenylphenol. Trash and refuse were cleaned and burned and the areas sprayed with the disinfectant which was used throughout the program, in the ratio of 1 gallon of disinfectant to 80-100 gallons of water, depending on what was being disinfected.

### Restrictive Measures

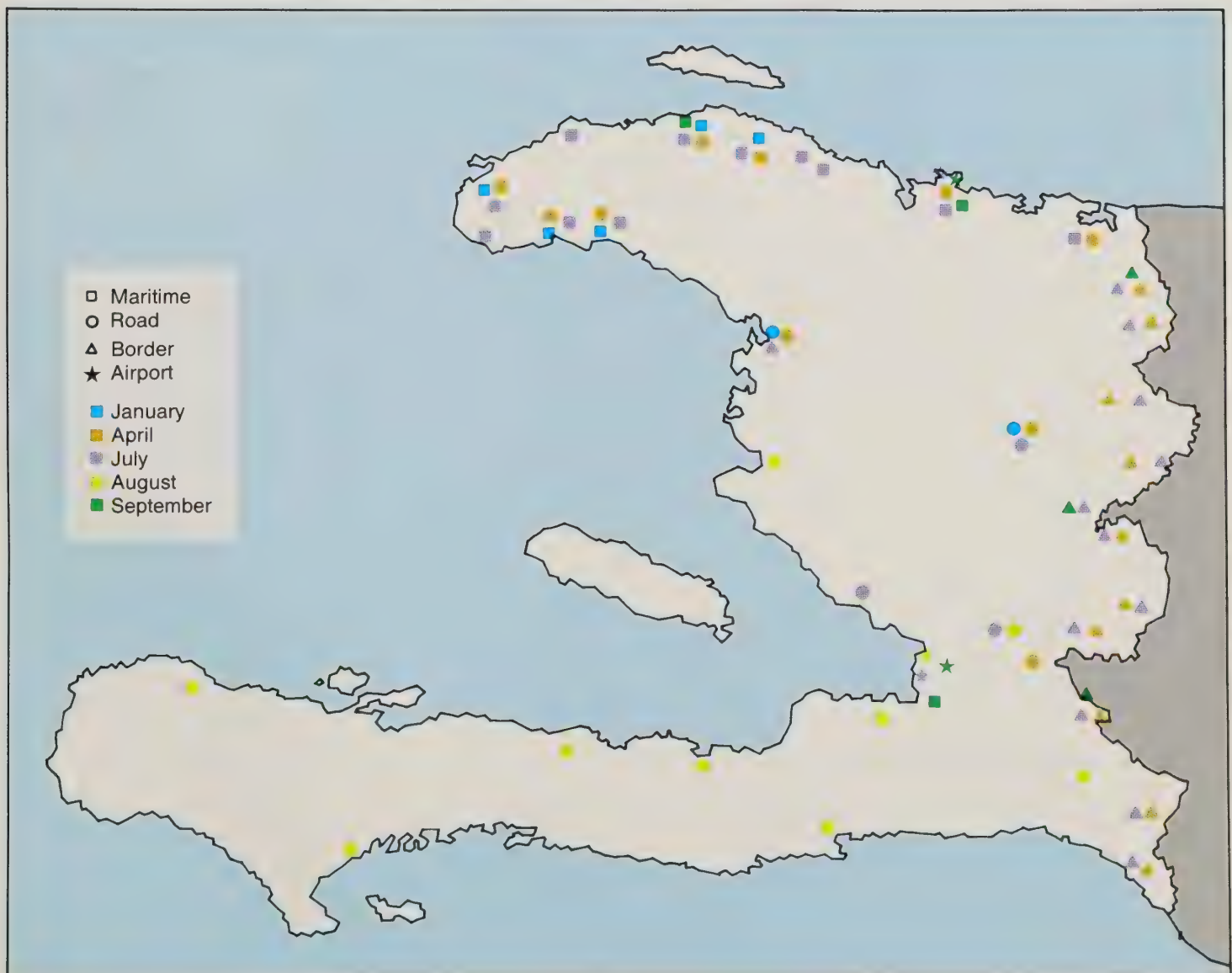
During the course of the program, it was necessary to adopt a number of restrictive measures. One was to stop importation of all pork and pork products and thereby force the consumption of all local pork supplies. Information workers began to advise the public to consume any pork they had in the free areas as soon as possible, so that it would not constitute a risk to the sentinel pigs that were scheduled to arrive soon. In the

larger towns, after suitable notice, inspectors confiscated pork found in supermarkets and meat lockers, and then disinfected these sites.

As the slaughter sweep progressed, it was necessary to set up inspection stations at strategic locations to make sure pigs or pork products were not brought back into cleaned areas. Cleaning and disinfection units were stationed at control posts and if any pigs or pork were found in any vehicles, they were

Figure 10.

**Map Showing the Locations of the Cleaning and Disinfection Control Posts Set Up Between January and September in 1983.**





confiscated and the vehicle cleaned and disinfected.

Another measure was an order to destroy all hog cholera vaccine stocks in the country. Because the new pigs to be brought in were to come from countries free of hog cholera, it was essential to prevent possible outbreaks originating from vaccine sources.

#### **Missed Pigs—"Raking"**

The search for missed or hidden pigs (raking) began in an area 2 months after the completion of systematic swine slaughter. This was done in order to allow uncooperative owners to eliminate the remaining swine either by taking them to other slaughtering centers or by killing them at voodoo ceremonies.

Before raking began, a series of meetings was held with villagers to ask them to voluntarily slaughter all hidden swine in order to not be

subjected to drastic police action. After this, the Chief of Section and his assistants would conduct extensive searches for missed swine. Funds were allocated to hire people who would work under the supervision of the rural Chiefs of Section. Once raking was complete, the Chief of Section signed an statement certifying that no pigs remained in his area. There were a total of 552 sections in Haiti, and each chief knew his section very well.

## ASF During the Slaughter Program

Once the slaughter program began, practically no clinical cases of ASF were seen either at the kill sites or elsewhere. Although many pigs were found to be positive serologically, no active cases were found.

### Serological Surveys

During the entire slaughter operation, some 34,488 serum samples were collected. About 2 percent were positive for ASF antibodies. This can be compared to the 20 percent positive from outbreak areas prior to the

slaughter program. ASF positives were found in all rural sections and on all the outlying islands. Although 470 tissue samples were collected during the campaign, only four were positive for ASF.

### Recommendations to Retain Native Pig Stock

Some groups in Haiti were anxious to keep a stock of native black Haitian pigs in case the replacement pigs did not adapt well. Attempts were made to preserve a small group

of 58 negative pigs on the Isle of Tortue off the North Coast. Unfortunately, they were not well cared for, and nine died. Subsequently, a few were positive for ASF, and the whole group was sacrificed in August 1983. Evidently, some pigs had been brought from the mainland to escape slaughter operations and had introduced the disease.

### Wild Pigs

There had been reports that some wild or feral or "free" pigs could be

Figure 11.

## Areas Where Feral Pigs Were Found and Elimination Activities Were Carried Out.





found in Haiti. A special team was brought to Haiti from the University of Georgia to carry out a survey and direct a concentrated effort to eliminate any feral pigs found. The campaign started on May 11, 1983, and continued until September 26, 1984.

Various methods were used to capture feral swine for ASF tests:

- hunting with trained dogs brought from the United States,
- hunting with local hunters and Haitian dogs,
- baiting and trapping and snaring,
- shooting from elevated platforms in burned-over areas,
- spotlighting at night in truck garden areas.

During the 17-month feral swine program, 14 areas were investigated. Feral swine were confirmed in seven of these areas. Blood and tissue samples were collected from pigs in four areas (Colminy, La Pierre, Mare Rouge, and Grand Boucan). Of the 106 swine captured, 85 were sampled. Positive ASF pigs were found only in La Pierre, where 9 of 25 sera showed ASF antibodies. ASF virus was not recovered from any of these swine. The last pig from La Pierre was caught on March 3, 1984.

To improve the chances of eliminating all the feral swine in Haiti, bounties were offered. Initially, the bounty ranged from \$10 to \$40 depending on the size of the animal, but beginning in February 1984, a \$300 bounty was paid for any pigs brought in regardless of size.

Two wild pigs were found to be positive for ASF in the La Pierre area in February 1984 and again in March 1984. The Government of Haiti had intended to declare Haiti free from ASF about this time. Consequently,

Table 2:

### Wild, Feral, or "Free" Pigs in Haiti During the Eradication Program

Area	Number Pigs Captured	Number Pigs Sampled	Number Pigs Estimated Remaining	Serological Results Results	Virus Isolation
La Pierre	31	25	2	8/25 (32%)	0
Colminy	48	35	10	0/35 ( 0%)	0
Grand Plaine	0	0	1	-	-
Mare Rouge	7	7	15	0/7 ( 0%)	0
Grand Boucan	18	18	2	0/18 ( 0%)	0
Cap Haitien	1	0	0	NS	-
Marbriol	1	0	0	NS	-
Totals:	106	85	30		

this was delayed until September 1984 to comply with the International Office of Epizootics (OIE) recommendation of a 6-month period between the last case and a declaration of free status.

When the search for the wild pigs ended in September 1984, there was no guarantee that those that were left might not be infected with ASF, but the work could not be continued indefinitely. To date, there is no indication that any residual ASF foci were left.

#### AIDS and ASF

A university researcher, not associated with the project, suggested that there could be some relationship between Acquired Immune Deficiency Syndrome (AIDS) and ASF. The two diseases and their viruses were somewhat similar and AIDS had been found to be highly prevalent in Haitians, both in Haiti and the U.S. However, sera from AIDS cases were found to be negative for ASF, and similarly sera from ASF-positive pigs were negative for AIDS. Also, subsequent studies showed that the viruses were not similar and that no relationship existed between them or the two diseases.

#### ASF Virus Survival

Efforts were made during the course of the slaughter program to determine whether or not the ASF virus was able to survive in the field. Soil from various kill sites was processed and injected into pigs stressed with cortisone. Pig bones collected around the countryside were tested in the same way. All results were negative.

From the start of the program, the USDA laboratory specialist, on his own initiative, had been following several ASF serologically positive pigs confined near the laboratory at Damien. As program activities were terminated, these pigs were sacrificed, and ASF virus was isolated in some of them. This demonstrated that the carrier state could last for at least a 3-year period.

### Haiti-Dominican Republic Commission

Because the Dominican Republic had recently completed its depopulation program and was actively involved in a sentinelization and repopulation program, it was considered worthwhile to have some mechanism whereby Haiti could profit from this experience. Therefore, a Haiti-Dominican Republic Commission was established which met four times and discussed common problems. Of particular importance was the need to prevent ASF from reentering the Dominican Republic from Haiti. With all the pigs eliminated in the Dominican Republic, there would be an obvious temptation to bring pigs and pork in from Haiti and sell them at high prices, certainly higher than could be obtained in Haiti.

### Sentinelization

By the beginning of 1983, the slaughter program was progressing very well, and plans were being made to receive the first shipment of sentinel pigs for placement in the Northwest trial area.

A total of 2,000 Specific Pathogen Free (SPF) pigs (boars and gilts) were to arrive, in staggered shipments for distribution to some 840 sentinel sites throughout the country. They were to be placed at sites where there had been clinical ASF, or high mortalities,

where water was available, and where the site was accessible to 4-wheel-drive vehicles. The sentinel sites were chosen so that at least one site was located in each of the 556 rural sections that was accessible by vehicle.

The bid for the first shipment of sentinel pigs was granted to a Canadian supplier, as the low bidder. However, the procedure for purchasing sentinel pigs was changed for the next shipments, limiting the suppliers to U.S. producers, since the funds for the purchases were coming from U.S. sources.

The first shipment of pigs arrived in April 1983, and the pigs were taken directly to an improvised quarantine facility at Jean Rabel for a 30-day quarantine. An official quarantine station near the airport was not yet ready for use, and there were still native pigs in the Port-au-Prince area. After the 30-day period, the pigs were placed at the test sites. The person who would care for the pigs would be paid a nominal fee and would be given some of the offspring. Feed for the pigs was to be supplied by the project. The sites were visited frequently by project personnel to monitor the sentinel pigs' progress, and blood samples were collected on the 1st, 45th, and 90th days for examination for ASF. Although there were some losses from a variety of causes, none became ill from ASF or were positive for ASF antibodies.

Except for some cases of atrophic rhinitis and mycoplasma pneumonia, there were few mortalities among the sentinel pigs. One difficulty experienced was an outbreak of *Hemophilus parasuis* infection at the quarantine station at Mais Gate near the International Airport. Some pigs died before the outbreak was controlled with antibiotic treatment. After a suitable recovery period, the affected pigs and their contacts were sent out to sentinel sites, without any further difficulty.

There was some question in the later stages of the sentinelization program whether it was necessary to continue to use SPF pigs for sentinels since they were expensive. However, a decision was made to continue using them to reduce the risk of introducing disease into the new pig population in Haiti.

As an economic measure toward the middle of the sentinelization program, the period of time that the pigs were kept at the sentinel sites was shortened from 90 days to 45 days, after which they were available for breeding purposes.

The last sentinel pigs were received in October 1983, and sentinelization was completed in December 1983. However, the search for wild pigs continued until September 1984.



## Sentinel Pig Program - 1983

Figure 12.

### Locations of the Quarantine Centers and Arrival Dates of SPF Pigs in 1983.



Figure 13.

#### Overview

- Total pigs - 2000
- Sentinel sites - 840
- Gilt/boar ratio - 9:1/15:1
- Boars kept at Reception Centers
- Age upon arrival - 3 months
- 3-4 week adaptation in Reception Center
- 45 days at first sentinel site
- Transfer for another 45 days at 2nd sentinel site in same rural section

# Sentinel Pig Program - 1983

Table 3:

## Arrival and Distribution of Sentinel Swine

Arrival of Pigs	No. of Pigs	Reception Center	1st Distribution	No. of Sites	2nd distribution	No. of Sites
Apr. 25	149	Jn. Rabel	Jun. 10-15	30	Aug. 1-5	30
Jun. 16	151	Jn. Rabel	Aug. 5	30	Sept. 30	30
Jul. 6	300	Cap Haitien	Aug. 1	60	Sept. 9	60
Jul. 30	300	Cap Haitien	Aug. 21	60	Oct. 7	60
Aug. 5	275	Cayes	Aug. 26	60	Oct. 12	60
Aug. 27	275	Cayes	Sept. 20	60	Nov. 6	60
Sept. 1	275	Port-au-Prince	Sept. 22	60	Nov. 7	60
Sept. 23	275	Port-au-Prince	Oct. 15	60	Nov. 28	60
Total:	2,000			420		420

Figure 14.

## Site Conditions

- Sites selected for:
  - 1) Positivity for ASF
  - 2) Accessibility
  - 3) Water
  - 4) Caretaker's experience with pigs
- Pigsheds built by caretaker with locally available materials
- PEPPADEP provides 1 sack cement
- Caretaker paid \$40 per 45 days
- PEPPADEP provides 5 lbs feed supplement per day

Figure 15

## On-Site Testing

- After pigs were kept in pigsheds for 7-10 days, they were released to forage during the day and were penned up nightly.
- Initially, the technicians visited the pigs daily for the first 7-10 days. After this, visits were made only 2-3 times per week. Supervisory visits were made by a veterinarian during the entire period once a week.
- Gilts at the sites were bred when mature.



## **Strengthening of Haiti's Animal Health System**

### **Plans for a New Laboratory**

During negotiations for approval of the project, the United States had agreed to provide funds for a new animal health laboratory, and \$376,000 was allocated. An architectural firm in Port-au-Prince received the bid to construct the laboratory in November 1983, and it was completed by May 1985.

During the negotiations for a new laboratory, the FAO representative pledged support for the purchase of equipment and supplies, but the purchase was never officially approved by FAO Headquarters and the funds were never made available.

### **Animal Quarantine Program**

In the latter stages of the ASF eradication program, an effort was made to reinforce the Haitian animal quarantine program at airports, seaports, and border stations to insure that ASF would not reenter the country when all the native pigs had been eliminated and the new pigs brought in. Specialists in quarantine programs were brought in to conduct training sessions with program personnel, and operational procedures were reviewed and strengthened.

With the shortage of funds and the termination of the slaughter program, it was necessary to make severe cuts in personnel and program operations. Information activities were curtailed and finally suspended by September 1983. Cleaning and disinfection activities were reduced. Staff morale suffered, and it became increasingly difficult to enforce discipline. In September 1983, it was announced that the available funds would only permit operations until December 15, 1983, 3 months before the planned termination date. Only the most essential activities such as the raking, the operation of the sentinel program, and the laboratory were to be continued. Raking was to be completed by November 1983.

### **Transfer of Supplies and Equipment**

At the termination of the eradication program in December 1983, an inventory of supplies and equipment was made, and much of it was turned over to the Government of Haiti, some to the USAID Interim Repopulation Project, and some to IICA.

### **International Funding Participation**

Initially the United States planned to contribute \$14,500 million to the project. Eventually, it contributed \$21,903 million. Part of this was to compensate for the reduced payment from Mexico and to build the laboratory. Also, more pigs had to be slaughtered than had been estimated originally. The final contribution from Canada for services of its personnel was \$722,000. Mexico contributed \$432,482 including the salaries of the veterinarians assigned to the project. FAO's total contribution for the salary of its laboratory advisor and for laboratory equipment and operational costs was \$406,000. Almost \$24 million had been spent by all concerned in the project.



### Interim Repopulation Project

Since the eradication project ended earlier than suspected, and as the negotiations with IDB for a loan for repopulation continues, there was a need for a program to bridge the gap and accelerate the process of replacing the pigs slaughtered. Although the 2,000 sentinel pigs would be used in this way also, other sources of new pigs had to be found if the pigs were to reach the villagers in a timely fashion.

Fortunately, USAID decided to support this program and approved a \$3 million, 18-month Interim Repopulation Project on September 29, 1983. The project was to be administered by IICA. The pigs brought in were to be kept at reproduction centers, and the offspring sent to various secondary multiplication centers around the country where private religious and voluntary groups were in a position to feed them and care for them properly. From these groups, the subsequent offspring would eventually reach the villagers.

On February 16, 1984, the Government of Haiti announced that it would approve importation of pigs, and SPF pigs were purchased for the interim repopulation project.

The interim project has been successful. New pigs were brought in as a nucleus breeding herd (430 sows and 32 boars, mainly Yorkshire, Hampshire, and Duroc) for 2 breeding centers.

Through the cooperation of 130 nongovernmental, voluntary organizations in the country, the program was able to establish a network of 440 secondary multiplication centers throughout the countryside. These centers received 10,600 pigs from the two central breeding centers and have in turn distributed more than 110,000 pigs to small farmers.

At the present time there are some 200,000 pigs in Haiti, and the swine population is increasing rapidly.

An important part of the program has been to provide training for personnel of the secondary multiplication centers in basic swine husbandry. Approximately 300 villagers have been trained each month in swine management, nutrition, animal health, and meat processing.

### Negotiations for an IDB Loan for Repopulation

Before Haiti could be granted an IDB loan, it was necessary that a study be carried out to show that such a program was feasible. The Government of Haiti requested such a study in mid-1982, and the IDB provided funds for this purpose to IICA.

The study was initiated in August 1982, and the results were forwarded to the IDB in April 1983. The Bank approved the loan in December 1983, but the funds could not be released until Haiti was declared free of ASF. This was done in September 1984. In January 1985, the bank advised the Government of Haiti that it had met all the requirements for the loan.

Because of the unstable political situation at that time, the Government of Haiti declined to accept the loan, and negotiations were suspended indefinitely. At the present time, in view of the successful outcome of the Interim Population Project, there is some question whether the IDB loan is needed and whether it can be properly utilized.

Finally, in 1988, 4 years after the conclusion of the ASF eradication program in Haiti, it is possible to take stock of what was accomplished.

Against all odds, the project was completed. All the native pigs were eliminated and thereby ASF. In addition, a number of other swine diseases, such as hog cholera, were eradicated. The repopulation program is beginning to pick up speed, and if the current progress continues, the pig population in Haiti should reach its pre-eradication levels in 3-4 years. The quality of the pigs being raised in the country has improved. In time, this should offset the severe losses suffered by the villagers during the last 6 years. The Haitian farmers soon will have all their pigs back—bigger and better than before. A sound animal health program to protect the gains made so far in Haiti still needs to be developed.



## Acronyms

AIDS	Acquired Immune Deficiency Syndrome
ASF	African Swine Fever Peste Porcine Africaine Fiebre Porcina Africana Maladie de Montgomery
CIDA	Canadian International Development Agency
MARNDR	Ministere de l'Agriculture, des Ressources Naturelles et du Developement Rural  Haitian Department of Agriculture, Natural Resources and Rural Development
ELISA	Enzyme Linked Immunosorbent Assay
FAO	Food and Agriculture Organization of the United Nations
GOH	Government of Haiti
IEOP	Immunolectrosmophoresis
IDB	Inter-American Development Bank
IICA	Inter-American Institute for Cooperation on Agriculture
NASDA	National Association of State Departments of Agricul- ture
NPPC	U.S. National Pork Producers Council
PEPPADEP	Project d' Eradication de la Peste Porcine Africaine et du Developpement de l' Elevage Porcine en Haiti Project for ASF Eradication and Swine Industry Development in Haiti
SARH	Mexico Department of Agriculture and Water Resources
SPF	Specific Pathogen Free
TCP	Technical Cooperation Programs (of the Food and Agriculture Organization of the United Nations)
UNDP	United Nations Development Program
USAHA	United States Animal Health Association
USAID	United States Agency for International Development
USDA	United States Department of Agriculture

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